CLAIMS

1. An echo canceller circuit comprising:

a digital filter having adaptive tap coefficients to simulate an echo response occurring during the call, the adaptive tap coefficients being updated during the call using a Least Mean Squares process having an adaptive gain *a*; and

channel condition detection means responsive to detected channel conditions for changing the adaptive gain *a* during the call.

2. An echo canceller circuit as claimed in claim 1 wherein the channel condition detection means is responsive to a double-talk channel condition and sets the adaptive gain *a* equal to zero in response thereto.

3. An echo canceller circuit as claimed in claim 1 wherein the channel condition detection means is responsive to a high background noise channel condition and lowers the adaptive gain *a* in response thereto.

4. An echo canceller circuit as claimed in claim 3 wherein the channel condition detection means is responsive to a high background noise channel condition and lowers the adaptive gain *a* to a value that is dependent on a level of the background noise that is detected.

5. An echo canceller circuit as claimed in claim 1 wherein the channel condition detection means is responsive to a narrow band signal condition and lowers the adaptive gain *a* in response thereto.

6. An echo canceller circuit as claimed in claim 5 wherein the adaptive gain *a* is set equal to about or less than 0.25.

7. An echo canceller circuit as claimed in claim 5 wherein the adaptive gain *a* is set equal to about or less than 0.125.

8. An echo canceller circuit as claimed in claim 1 wherein the channel condition detection means is responsive to a non-linear echo path condition and lowers the adaptive gain *a* in response thereto.

9. An echo canceller circuit as claimed in claim 8 wherein the adaptive gain *a* is set equal to about or less than 0.25.

10. An echo canceller circuit as claimed in claim 1 wherein the channel condition detection means is responsive to convergence of the adaptive filter and lowers the adaptive gain *a* in response thereto.

11. An echo canceller circuit as claimed in claim 10 wherein the adaptive gain *a* is set equal to or less than 0.25.

12. An echo canceller circuit as claimed in claim 10 wherein the adaptive gain *a* is set equal to about or less than 0.125.

13. An echo canceller comprising:

at least one input for receiving a far-end signal of a call;

at least one input for receiving a signal-plus-echo signal of the call, the signal-plus-echo signal having a signal component corresponding to an echo response of a transmission medium carrying the call;

a first digital filter receiving the far-end signal and having non-adaptive tap coefficients to simulate the echo response;

a summer circuit for subtracting the filtered far-end output signal of the first digital filter from the signal-plus-echo signal to generate an echo compensated signal for transmission to a far-end;

a second digital filter receiving the far-end signal and having adaptive tap coefficients to simulate the echo response, the adaptive tap coefficients being updated during the call using a Least Mean Squares process having an adaptive gain a;

a coefficient transfer controller disposed to transfer the adaptive tap coefficients of the second digital filter to replace the tap coefficients of the first digital filter when a set of one or more conditions are met; and

a channel condition detector responsive to detected channel conditions for changing the adaptive gain a during the call.

14. An echo canceller as claimed in claim 13 wherein the coefficient transfer controller transfers the adaptive tap coefficients of the second digital filter to replace the tap coefficients of the first digital filter when $\hat{E}$ is greater than $\overline{E}$ and, concurrently, $\hat{E}$ is greater than E_{max}, wherein $\overline{E}$ corresponds to the ratio between a signal-plus-echo signal and a first echo compensated

signal using the first digital filter, $\hat{E}$ corresponds to the ratio between a signal-plus-echo signal and a second echo compensated signal using second digital filter, and E_{max} corresponds to the largest $\hat{E}$ occurring over a call during which a transfer has occurred.

15. An echo canceller as claimed in claim 13 wherein the channel condition detection means is responsive to a double-talk channel condition and sets the adaptive gain a equal to zero in response thereto.

16. An echo canceller as claimed in claim 13 wherein the channel condition detection means is responsive to a high background noise channel condition and lowers the adaptive gain a in response thereto.

17. An echo canceller as claimed in claim 13 wherein the channel condition detection means is responsive to a high background noise channel condition and lowers the adaptive gain a to a value that is dependent on a level of the background noise that is detected.

18. An echo canceller as claimed in claim 13 wherein the channel condition detection means is responsive to a narrow band signal condition and lowers the adaptive gain a in response thereto.

19. An echo canceller as claimed in claim 18 wherein the adaptive gain a is set equal to about or less than 0.25.

20. An echo canceller as claimed in claim 18 wherein the adaptive gain a is set equal to about or less than 0.125.

21. An echo canceller as claimed in claim 13 wherein the channel condition detection means is responsive to a non-linear echo path condition and lowers the adaptive gain a in response thereto.

22. An echo canceller as claimed in claim 21 wherein the adaptive gain a is set equal to about or less than 0.25.

23. An echo canceller as claimed in claim 13 wherein the channel condition detection means is responsive to convergence of the adaptive filter and lowers the adaptive gain a in response thereto.

24. An echo canceller as claimed in claim 23 wherein the adaptive gain a is set equal to or less than 0.25.

25. An echo canceller as claimed in claim 23 wherein the adaptive gain a is set equal to about or less than 0.125.